

**PATENT**

Atty. Dkt. No.: AVIS/1014C

1. (Cancel without prejudice) A method of purifying used oil comprising the steps of:

placing used oil into a continuous flow apparatus;

contacting the used oil with a base introduced at such a rate as to maintain the base at about 1 weight % to about 10 weight % of the oil composition;

contacting the used oil with a phase transfer catalyst introduced at such a rate as to maintain the phase transfer catalyst at about 2. weight % to about 10 weight % of the oil composition;

heating the composition to a temperature between about 200°C and about 275°C;

mixing the composition;

separating the resultant mixture using a first distillation at a temperature of from about 200°C to about 275°C and a pressure of from about 100 torr to about 200 torr; and

purifying the used oil using a second distillation at a temperature of from about 275°C to about 300°C and a pressure of from about 0.05 torr to about 0.20 torr.

2. (Cancel without prejudice) The method as recited in Claim 1 additionally comprising the step of:

heating the oil composition obtained from the first distillation to a temperature between about 200°C and about 300°C; and

mixing the composition after the first distillation but before the second distillation.

3. (Cancel without prejudice) A method of purifying used oil comprising the steps of:

placing used oil into a continuous flow apparatus;

contacting the used oil with a base selected from the group including sodium hydroxide and potassium hydroxide introduced at such a rate as to maintain the base at about 1 weight % to about 10 weight % of the oil composition;

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contacting the used oil with ethylene glycol introduced at such a rate as to maintain the phase transfer catalyst at about 1 weight % to about 10 weight % of the oil composition;

heating the composition to a temperature between about 200°C and about 275°C;

mixing the composition;

separating the resultant mixture using a first distillation at a temperature of from about 200°C to about 275°C and a pressure of from about 100 torr to about 200 torr; and

purifying the used oil using a second distillation at a temperature of from about 275°C to about 350°C and a pressure of from about 0.05 torr to about 0.20 torr.

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4. (Amended) A method for purifying used oil, comprising:
- mixing the used oil with a phase transfer catalyst in the presence of a base compound; and
  - removing contaminants from the used oil.
5. (Amended) The method of claim 4, wherein the phase transfer catalyst comprises quaternary ammonium salts, polyol ethers, glycols, or crown ethers.
6. (Amended) The method of claim 4, wherein the phase transfer catalyst comprises ethylene glycol.
7. (Amended) The method of claim 4, wherein removing contaminants from the used oil comprises distilling the motor oil at a temperature of about 200°C to about 275°C and a pressure of about 100 torr to about 200 torr.
8. (Amended) The method of claim 4, wherein removing contaminants from the used oil comprises distilling the used oil at a temperature of about 275°C to about 300°C and a pressure of about 0.05 torr to about 0.2 torr.

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9. (Amended) The method of claim 4, wherein removing contaminants from the used oil comprises distilling the used oil at a temperature of about 200°C to about 300°C and a pressure of about 0.05 torr to about 200 torr.
10. (Cancel without prejudice) The method of claim 1, further comprising contacting the used oil with a base compound.
11. (Amended) The method of claim 4, wherein the base compound is an inorganic or organic base compound.
12. The method of claim 11, wherein the inorganic base compound is selected from the group consisting of sodium hydroxide, potassium hydroxide, and combinations thereof.
13. (Amended) The method of claim 4, wherein a mixture of the used oil and phase transfer catalyst comprises about 1% to about 10% by weight of the phase transfer catalyst.
14. (Amended) The method of claim 4, wherein a mixture of the used oil and base compound comprises about 1 % to about 10 % by weight of the base compound in volume of solution.
15. (Amended) The method of claim 4, wherein a mixture of the used oil and base compound comprises about 0.5 % to about 5 % by weight of the base compound in volume of solution.
16. (Amended) The method of claim 4, wherein the used oil comprises motor oil.
17. (Amended) A method for removing contaminants from a petroleum distillate, comprising:

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mixing the distillate with ethylene glycol in the presence of a base compound;  
and

removing the contaminants from the distillate using means for distillation.

18. The method of claim 17, wherein the petroleum distillate comprises motor oil.

19. The method of claim 17, wherein removing contaminants from the distillate comprises distilling the distillate at a temperature of about 200°C to about 275°C and a pressure of about 100 torr to about 200 torr.

20. The method of claim 17, wherein removing contaminants from the distillate comprises distilling the distillate at a temperature of about 275°C to about 300°C and a pressure of about 0.05 torr to about 0.2 torr.

21. The method of claim 17, wherein removing contaminants from the distillate comprises distilling the distillate at a temperature of about 200°C to about 300°C and a pressure of about 0.05 torr to about 200 torr.

22. The method of claim 17, wherein a mixture of the distillate and ethylene glycol comprises about 1% to about 10 % by weight of ethylene glycol.

23. (Amended) The method of claim 17, wherein a mixture of the distillate, ethylene glycol and base compound comprises about 1 % to about 10 % by weight of the base compound in volume of solution.

24. The method of claim 23, wherein a mixture of the distillate and base compound comprises about 0.5 % to about 5 % by weight of the base compound in volume of solution.

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25. (Amended) A method for removing contaminants from motor oil, comprising:  
mixing the motor oil with ethylene glycol in the presence of a base compound;  
and then  
distilling the motor oil at a temperature of about 200°C to about 300°C and a  
pressure of about 0.05 torr to about 200 torr.
26. (Amended) The method of claim 25, wherein the base compound comprises an  
inorganic compound.
27. (Amended) The method of claim 26, wherein the inorganic base compound is  
selected from the group consisting of sodium hydroxide, potassium hydroxide, and  
combinations thereof.
28. The method of claim 25, wherein a mixture of the motor oil and ethylene glycol  
comprises about 1 to about 10 % by weight of the ethylene glycol.
29. (Amended) The method of claim 25, wherein a mixture of the motor oil and  
base compound comprises about 1 % to about 10 % by weight of the base compound in  
volume of solution.
30. (Amended) The method of claim 25, wherein a mixture of the motor oil and  
base compound comprises about 0.5 % to about 5 % by weight of the base compound  
in volume of solution.
31. A method for removing contaminants from motor oil, comprising:  
mixing the motor oil with an inorganic base compound;  
mixing the motor oil with a phase transfer catalyst; and then  
distilling the motor oil at a temperature of about 200°C to about 275°C and a  
pressure of about 100 torr to about 200 torr.

32. The method of claim 31, wherein the inorganic base compound is selected from the group consisting of sodium hydroxide, potassium hydroxide, and combinations thereof.
33. The method of claim 31, wherein the phase transfer catalyst comprises quaternary ammonium salts, polyol ethers, glycols, or crown ethers.
34. The method of claim 31, wherein the phase transfer catalyst comprises ethylene glycol.
35. The method of claim 31, further comprising distilling the motor oil at a temperature of about 275°C to about 300°C and a pressure of about 0.05 torr to about 0.2 torr.
36. The method of claim 31, wherein a mixture of the motor oil and phase transfer catalyst comprises about 1 to about 10 % by weight of the phase transfer catalyst.
37. The method of claim 31, wherein a mixture of the motor oil and inorganic base compound comprises about 1 % to about 10 % by weight of the inorganic base compound in volume of solution.
38. (Amended) The method of claim 31, wherein a mixture of the motor oil and base compound comprises about 0.5 % to about 5 % by weight of the base compound in volume of solution.